THE FOUNDATION FOR SCIENCE AND TECHNOLOGY

LECTURE AND DINNER DISCUSSION SUMMARY SHEET

# Stem Cell Therapy: promise or threat?

Held in the rooms of the Royal Society on 31 October 2000
Sponsored by: The Wellcome Trust

---

*In the Chair:*
Mr. David Moorhouse, Chairman, Lloyd's Register

*Speakers:*
Professor Peter Lachmann FRS , President, Academy of Medical Sciences
Professor John Clark OBE FRSE, Head of Molecular Biology, Roslin Institute, Edinburgh
Professor Robin Gill, Michael Ramsey Professor of Modern Theology, University of Kent at Canterbury

Professor Clark outlined the techniques involved. Donor cells were transferred into an unfertilized oocyte. This developed in culture. Within this mass were the pluripotent stem cells which had the ability to differentiate into all major cell lineages. Research had already shown that such cells were stable, had an immense value, not only for basic research into gene discovery and toxological testing, but for a wide range of therapeutic use. Nerve cells, for example, could be used in treatment for Parkinson's or stroke, heart muscle cells for congestive heart failure, and pancreatic cells for diabetes. However there were many problems to be overcome. We did not yet know, for example, how to scale up the cells, or how rigorously tested for safety. The biggest problem was that of possible immunological rejection. This could be overcome by autologeous transfer - i.e taking the cell from the same person as the transplant. But the key issue was still understanding exactly how the oocyte functioned and what it did.

Professor Lachmann considered the reasons why work on these new developments was so strongly opposed. He identified, and rebutted, six reasons. First, it was said that any resulting therapy would benefit only the rich, because it would be so expensive. This ignored the history of declining costs as technologies became established and widespread, and the greater economy of cure instead of control technologies. Second, it would divert funds from other research, but the research involved was fundamental biological research, which had value over a wide area. Third, it was "playing at being God". To the extent that this phrase had any meaning, it appeared to assume that evolution led to perfection with which none must interfere.

But evolution was a series of messy compromises between conflicting aims where any result carried some disadvantages. Most therapies were efforts to overcome or minimize these disadvantages: there was no reason to exclude promoting genetic options from such efforts. Fourth, the technique involved creating an embryo and killing it: this was murder. This view assumed that a 5 to 6 day old embryo had the same rights and status as a sick adult. But even the Catholic church, before 1869, accepted that an embryo's status changed as it developed. Moreover somatic cell nuclear transfer did not involve fertilization and pre implementation embryos are continuously discarded by the body. Fifth, the technique could be used for reproductive cloning. But the rules against this were strong. UNESCO forbids "enhancement" and reimplantation is not permitted in stem cell research. Sixth, you might create an immortal human. This was so wildly optimistic that it was not even worth worrying about now.

Professor Gill gave a cautious but genuine welcome to the research on the grounds that there was an expectation that real benefit might come from it. He certainly did not think there were no problems involved, but they were essentially about means, not ends. He did not accept the argument that destroying the six day old embryo was murder, and could not be justified by benefits to others. He considered that it was necessary to have respect for an embryo, but this did not entail its having the same status at the start of its existence as it would have after various stages of development. It was true that one could not be certain that the therapeutic benefits promised from the research would happen, but it was reasonable to work on rational expectations. He noted that whereas, in the Warnock Committee, there had been dissenters against the prospect of permitting such research, there were none to the Donaldson recommendations. He strongly supported the firm Donaldson line against reproductive cloning. It was wrong to clone human beings, first, because it would be done without their consent, and, second, because there was no reason to expect benefit from it. Thus there was a fundamental difference, ethically, between therapeutic and reproductive cloning. Objections to the first were based on moral preference, reflecting different values, but objections to the second were based on an intrinsic moral imperative.

Underlying much of the subsequent discussion was a deep concern about the gap between public understanding of the issues, and the scientific and ethical principles which lay behind the research. This showed up in a number of ways. A good example was the semantic debate about whether it was right to use the word "embryo". An oocyte which had had a somatic nucleus transferred to it and was not implanted was not an embryo, nor was it a human being: it was material which could become a human being in quite different circumstances. It was the equivalent to vegetative reproduction in plants. Why, then, use the word "embryo"? The answer was that not to use the

word would raise the charge of being devious. People would not try to understand the difference, and would rest on their generic distrust of scientists. (shown by the false, although widespread, assumption that the BSE report had shown scientists to be at fault) to decide that they were being bamboozled. Again, the public thought that this research differed in some way from all previous research, because scientists could not predict with certainty its benefits, and because it might be misused. This research was no different. Indeed, it had a stronger ethical basis because there was a rational expectation that the end result would be to relieve suffering. To reject it was equivalent to putting a lower value on relieving suffering than on other values, such as respect for the "embryo" which will never become a human being. Of course there was risk - risk that the therapeutic benefits will prove illusory, or that there will be unintended use or consequences of the research - but a risk free society was unattainable. The issue was how to understand and limit risk.

Nevertheless, it had to accepted that public hostility would continue to exist, and inform political activity (witness the large number of letters MP's had from opponents of the research, and the absence of support) until there was some evidence of the beneficial therapeutic results of the research. There was debate about when this was likely to be - some thought 30 years, other 10. Although, no doubt, opinion would change over this period, it was strongly pressed that scientists should not wait. There was need for an effective scientifically based campaign to convince the public, and thereby politicians, of the need for, and benefits of, the research. It was suggested, however that one should be cautious about justifying the research solely on the basis of future benefits. The true justification lay in the search for knowledge. The empirical consequences of that search should be displayed in order to see whether ethical questions arose. It was only if ethical matters did arise from the facts that one need consider the ethical principles involved. It might be, in this case, because of the nature of the "embryo" material, that ethical questions did not arise.

Fears that, while research in this country could be adequately controlled, in other countries it might not, and so lead to misuse of the research for reproductive cloning, could not be overlooked. The UNESCO prohibition must be monitored and enforced. But it was naïve to suppose that if we stopped research in the UK, it would not go on elsewhere. Scientific research was done in an intensely competitive world, and if we do not use our research capability here, others particularly in the US - will take the lead. What was important in the UK was for legislation to keep up with advancing science. Ten years ago the Human Fertilization and Embryology Act had permitted research on embryos for certain purposes. Now, new research had shown that for others therapeutic purposes, research should be permitted. The scientific community should continue to press for new legislation to recognize this.

*The discussions were held under the rule that nobody contributing to them may be quoted by name after the event. None of the opinions stated are those of the Foundation for Science and Technology, since, by its constitution, the Foundation is unable to have an opinion.*

Foundation for Science &Technology,
*Buckingham Court, 78 Buckingham Gate, London SW1E 6PE*
*Tel: 020 7222 1222 Fax: 020 7222 1225*
*Company Limited by Guarantee No. 1327814 Charity Number 274727*